

**Notice of Allowability**

Application No.

09/877,801

Examiner

Michael P. Mooney

Applicant(s)

KEYS ET AL.

Art Unit

2883

*Am*

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 8/31/04 Amdt.
2. ☒ The allowed claim(s) is/are 1-22.
3. ☒ The drawings filed on 06 June 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_\_
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

*Signing for*  
*FRANK FONT*  
*Brian Hooley*  
**Brian Hooley**  
**Primary Examiner**

### **REASONS FOR ALLOWANCE**

The following is an examiner's statement of reasons for allowance:

The prior art, either alone or in combination, does not disclose or render obvious an optical phase modulator including the multilayer stack being disposed perpendicular to the optical signal to be modulated so that the signal passes serially through each dielectric layer of the plurality of dielectric layers and said dielectric layers being of at least three different thicknesses arranged in an aperiodic thickness pattern such that the phase modulator exhibits a near-linear phase modulation over a wide bandwidth in combination with the rest of claim 1 for the reasons stated by Applicant in the Remarks section filed 8/31/04.

It is noted that the claim 1 is allowable because the unique combination of each and every specific element stated in the claim.

The prior art, either alone or in combination, does not disclose or render obvious an optical switch including the multilayer stack including a plurality of dielectric layers and having a transmission function related to at least one optical property of the stack, for receiving an optical signal to be phase modulated, said stack including a plurality of alternating layers of two different thicknesses and a plurality of further layers of at least one further thickness interspersed within said plurality of alternating layers; said multilayer stack being disposed perpendicular to the optical signal to be phase modulated such that the signal passes serially through each dielectric layer of the plurality of dielectric layers in combination with the rest of claim 17 for the reasons stated by Applicant in the Remarks section filed 8/31/04.

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It is noted that the claim 17 is allowable because the unique combination of each and every specific element stated in the claim.

The prior art, either alone or in combination, does not disclose or render obvious a phase modulators means for producing a nonmechanical change in the at least one optical property of the stack to provide shifting of the transmission function to produce phase modulation of the optical input signal and to thereby produce a phase modulated output signal, wherein said at least optical property is refractive index, said dielectric layers each have a refractive index value, and said phase modulator means causes a variation in the refractive index of said dielectric layers such as to produce the shift in the transmission function, and wherein said modulator mean: decreases the refractive index of said dielectric layers so as to shift the transmission function to shorter wavelengths in combination with the rest of claim 19 for the reasons stated by Applicant in the Remarks section filed 8/31/04.

It is noted that the claim 19 is allowable because the unique combination of each and every specific element stated in the claim.

The prior art, either alone or in combination, does not disclose or render obvious a phase modulator wherein the dielectric layers include GaAs layers of a first thickness and AIAs layers of a second thickness, and further layers of relatively thin layers of AIAs of a different thickness from said second thickness inserted within selected layers of GaAs to smooth the transmission function of the stack in combination with the rest of claim 20 for the reasons stated by Applicant in the Remarks section filed 8/31/04.

It is noted that the claim 20 is allowable because the unique combination of each and every specific element stated in the claim.

The prior art, either alone or in combination, does not disclose or render obvious a phase modulator wherein the dielectric layers include GaAs layers of a first thickness and AlAs layers of a second thickness, and wherein said layers further include a plurality of relatively thick layers of GaAs of a thickness greater than the first thickness interspersed at regular intervals within the stack in combination with the rest of claim 21 for the reasons stated by Applicant in the Remarks section filed 8/31/04.

It is noted that the claim 21 is allowable because the unique combination of each and every specific element stated in the claim.

The prior art, either alone or in combination, does not disclose or render obvious a phase modulator comprising a plurality of dielectric layers and having a transmission function related to at least one optical property of the stack, for receiving an optical input signal to be phase modulated, said dielectric layers comprising alternating layers of two different thicknesses and further interspersed layers of at least one further thickness so that said stack comprises an arrangement of said dielectric layers of thicknesses having an overall non-repeating, aperiodic pattern in combination with the rest of claim 22 for the reasons stated by Applicant in the Remarks section filed 8/31/04.

It is noted that the claim 22 is allowable because the unique combination of each and every specific element stated in the claim.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

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accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael P. Mooney whose telephone number is 571-272-2422. The examiner can normally be reached during weekdays, M-F.

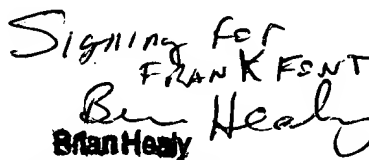
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on 571-272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-1562.

  
Michael P. Mooney  
Examiner  
Art Unit 2883

Frank G. Font  
Supervisory Patent Examiner  
Art Unit 2883

FGF/mpm  
11/9/04

  
Brian Healy  
Primary Examiner